

ART. II.—*Victorian Graptolites.*

PART I.

(a) ORDOVICIAN FROM MATLOCK.

(b) DICTYONEMA MACGILLIVRAYI, NOVI. MUT.

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(a) ORDOVICIAN FROM MATLOCK.

The small collection of graptolites, which is dealt with in the present communication, was made by Mr. E. O. Thiele during the Christmas vacation, and was kindly placed in my hands for examination through the agency of Mr. G. B. Pritchard.

The fossils occur in a black, earthy slate in which cleavage is but slightly developed at a very small angle to the bedding plane. They are preserved in a silvery white mineral, and though they thus stand out with remarkable distinctness on the dark background, yet the details of their structure are in most cases entirely wanting, so that specific determinations are not possible, except in the case of one species.

The commonest forms are clearly referable to the genus *Dicellograptus*. These occur in great profusion, being fairly matted together on some of the slabs. In no instance are the hydrothecæ shown with sufficient clearness to enable their form to be fully made out, or for counting. One or two examples have the habit and size of *Dicellograptus morrisii*, Hopk., approaching more nearly to Hopkinson's figure<sup>1</sup> than to that given by Lapworth.<sup>2</sup> The sicula is clearly shown, and the lateral spines can be made out in some of the specimens. What is another

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<sup>1</sup> Geol. Mag., viii., 1871, pl. i., f. 2a.

<sup>2</sup> Proc. Belfast Nat. Field Club, 1876-7, Appendix, pl. vii., f. 6.

species, apparently, has its branches diverging at an angle of about  $40^\circ$  and quite straight, measuring, in one instance, more than 5mm. in length. In some places the slabs are crowded with a great number of young examples of the same genus, showing the sicula and three spines very clearly at times, but in no case is the outline of the hydrothecæ visible.

The only other forms present are Diplograptidæ. Only one of these am I able to determine specifically. This is *Diplograptus foliaceus*, Murch. About half a dozen specimens occur. The hydrophyton is about one-and-a-half inches long and one-eighth inch broad, parallel sided for the greater part of its length and gradually tapering towards the proximal end, which is imperfect in all the specimens. The virgula is not visible. Hydrothecæ about twenty-five to the inch, and having the form shown by Hopkinson and Lapworth in two of their figures.<sup>1</sup>

There are two other species of *Diplograptus* which I am unable to determine with certainty.

The family Dieranograptidæ to which *Dicellograptus* belongs is, according to Lapworth, confined to the Upper Ordovician.<sup>2</sup> *Diplograptus foliaceus*, though not having exactly the same range, is associated with Dieranograptidæ in Britain, and I have identified the same species as occurring rarely at Darriwill. The beds at the latter place I previously placed tentatively on the horizon of the *Loganograptus* zone at Castlemaine.<sup>3</sup> Since then Mr. Pritchard and myself have paid two visits to Wilkinson's locality at Darriwill,<sup>4</sup> and from an examination of the fauna I am inclined to refer it to a slightly higher position than I did previously, though Dieranograptidæ have not been observed.

The only other fossil recorded from Mount Matlock is *Cardium gippslandicum*, M<sup>c</sup>Coy. This is also recorded from Russell's Creek, Gippsland, by Sir Frederick M<sup>c</sup>Coy, in association with *Orthoceras striato-punctatum*, Münst.<sup>5</sup> This association induces Sir Frederick to refer the beds containing the *Cardium* to the (Upper) Silurian.

The occurrence of Ordovician fossils at Matlock is consequently of considerable interest and indicates the presence of an inlier in

<sup>1</sup> Q. J. G. S. xxxi., 1875, pl. xxxv., figs. 7e, 7g.

<sup>2</sup> A. M. N. H. 5, vi., 1880, p. 21.

<sup>3</sup> Proc. Roy. Soc. Vic., viii. (N.S.), 1894, p. 76.

<sup>4</sup> W. L. S., 1, of Quarter Sheet 19, S.W.

<sup>5</sup> Geol. Surv. Vict., Progress Report, vi., 1880, p. 71.

the heart of what is mapped as (Upper) Silurian country. With regard to the extent of these lower rocks and the nature of their contact with the younger series we have as yet no knowledge, and as the matrix of the Museum specimen of *Cardium gippslandicum* from Matlock is very similar to that of the graptolites before me, great care will have to be exercised in mapping the area.

The horizon of the present fossils is very close to that indicated by the graptolites which I recently recorded from North-eastern Victoria, and is referable to the upper part of the Ordovician.

*Locality*.—Four miles from Matlock, on the Wood's Point Road (E. O. Thiele).

(b) *DICTYONEMA MACGILLIVRAYI*, nom. mut.

Some years ago I described and figured this species under the name of *D. grande*,<sup>1</sup> and two years later Mr. G. B. Pritchard described the hydrothecæ of the same species.<sup>2</sup> According to Bigsby<sup>3</sup> the name had previously been used by Barrande, but Jahn says only in manuscript if used by Barrande at all.<sup>4</sup> Since then the name has been applied by Nicholson to a Canadian form.<sup>5</sup>

The present species is distinct from Nicholson's, and I propose the name *D. macgillivrayi* for it, dedicating it to the late Dr. P. H. Macgillivray, whose labours in our recent and tertiary polyzoa are so well known.

It is of interest to note that the genus *Bryograptus* occurs commonly at Lancefield in association with this species, having been simultaneously recognised by Mr. Pritchard, and myself. The presence of this fossil satisfactorily confirms the relative position I had assigned to the beds, as containing the oldest graptolite fauna we know in Australia, Professor Lapworth regarding the genus as Upper Cambrian.<sup>6</sup>

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<sup>1</sup> Proc. Roy. Soc. Vic., iv. (N.S.), Pt. I., 1892, p. 6.

<sup>2</sup> Proc. Roy. Soc. Vic., vi. (N.S.), p. 28.

<sup>3</sup> Thes. Silur., p. 200.

<sup>4</sup> Sitz. d. K.K. Akad. d. Wiss. Wien, Bd. CI., Heft. vii., Ab. I., p. 642.

<sup>5</sup> A.M.N.H., 4, xi., 1873, p. 133.

<sup>6</sup> A.M.N.H., 5, v., 1880, p. 274.

Mr. J. E. Marr<sup>1</sup> classes all the zones of *Bryograptus* as of Tremadoc age, and in a letter he tells me that he considers the genus to be confined to the Tremadoc. Mr. R. Etheridge, jun., has already recorded Cambrian rocks from Victoria,<sup>2</sup> and his locality, Heathcote, is due north of Lancefield and approximately on the same strike, though the stratified palæozoic rocks of the two districts are separated from one another by the, presumably intrusive, granite of the Baynton Range. Selwyn<sup>3</sup> says that "Victorian palæozoic physical geology in its broadest features may be represented as consisting of a great . . . sinclinal trough of lower palæozoic (silurian) and older strata." I have previously given reasons for considering the rocks of N.E. Victoria to be of Upper Ordovician age.<sup>4</sup> Our knowledge of the fauna of the Palæozoic rocks west of Ballarat is as complete a blank to-day as it was when Selwyn wrote thirty years ago. The presence of Cambrian rocks on the meridian of Melbourne shows the existence of an axial line of elevation, with this peculiarity, that there is, as far as our present limited observations go, a descent in the exposed rocks as we pass northward. The recorded graptolites from near Bulla are Upper Ordovician, those of Lancefield are apparently of Tremadoc age, while, according to Mr. Etheridge, the small outcrop at Heathcote is probably Middle Cambrian. Whether this is due to the transverse folding which produced our Dividing Range, and, perhaps, also the remarkable "pitch" of our older rocks, is a question of great interest, but one which must rest till more data are available.

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<sup>1</sup> Science Progress, July, 1896, pp. 360-74.

<sup>2</sup> Proc. Roy. Soc. Vic. viii., (N.S.), 1895, p. 52.

<sup>3</sup> Vic. Internat. Exhibit. Essays, 1867, p. 9.

<sup>4</sup> Proc. Roy. Soc. Vic., ix., (N.S.), 1896, p. 183.